WHAT IS CLAIMED IS:

1. A system for carrying out a burn-in test on a great number of semiconductor devices that have been formed on a semiconductor wafer, each said device including a gate oxide film between a substrate and a gate electrode, the gate electrode being connected to a metal interconnect,

wherein the system comprises electromagnetic wave generating means for exposing the wafer to an electromagnetic wave as an alternating current wave and placing an electric field with a predetermined intensity on the gate oxide film of each said device on the wafer, thereby carrying out the burn-in test on the devices.

2. The system of Claim 1, further comprising:

stress sensing means for sensing a voltage stress imposed on the gate oxide film of each said device while the wafer is being exposed to the electromagnetic wave that has been generated by the electromagnetic wave generating means; and

control means for controlling the intensity of the electric field, which is represented by the electromagnetic wave generated by the electromagnetic wave generating means, so that the voltage stress sensed by the stress sensing means falls within a preset threshold value range.

3. The system of Claim 2, wherein the voltage stress, which has been sensed by the stress sensing means as being imposed on the gate oxide film, comprises a forward voltage stress and a reverse voltage stress, and

wherein the control means controls the electric field intensity of the electromagnetic wave, generated by the electromagnetic wave generating means, so that the forward and reverse voltage stresses imposed on the gate oxide film fall within first and second preset threshold value ranges, respectively, the second range being lower than the first range.

4. A method for carrying out a burn-in test on a great number of semiconductor devices that have been formed on a semiconductor wafer, each said device including a gate oxide film between a substrate and a gate electrode, the gate electrode being connected to a metal interconnect,

wherein the method comprises the step of exposing the wafer to an electromagnetic wave as an alternating current wave and placing an electric field with a predetermined intensity on the gate oxide film of each said device on the wafer, thereby carrying out the burn-in test on the devices.

5. The method of Claim 4, comprising the steps of:

sensing a voltage stress imposed on the gate oxide film of each said device while the wafer is being exposed to the

electromagnetic wave; and

controlling the intensity of the electric field, which is represented by the electromagnetic wave generated, so that the voltage stress sensed as being imposed on the gate oxide film falls within a preset threshold value range.

6. The method of Claim 5, wherein the voltage stress, which has been sensed as being imposed on the gate oxide film, comprises a forward voltage stress and a reverse voltage stress, and

wherein the electric field intensity of the electromagnetic wave generated is controlled so that the forward and reverse voltage stresses imposed on the gate oxide film fall within first and second preset threshold value ranges, respectively, the second range being lower than the first range.

7. A system for carrying out a burn-in test on a great number of semiconductor devices that have been formed on a semiconductor wafer, each said device including a gate oxide film between a substrate and a gate electrode, the gate electrode being connected to a metal interconnect,

wherein the system comprises electric field generating means for exposing the wafer to an electric field as an alternating current wave and setting the electric field placed on the gate oxide film of each said device on the wafer to a pre-

determined intensity, thereby carrying out the burn-in test on the devices.

8. The system of Claim 7, further comprising:

stress sensing means for sensing a voltage stress imposed on the gate oxide film of each said device while the wafer is being exposed to the electric field that has been generated by the electric field generating means; and

control means for controlling the intensity of the electric field, generated by the electric field generating means, so that the voltage stress sensed by the stress sensing means falls within a preset threshold value range.

9. The system of Claim 8, wherein the voltage stress, which has been sensed by the stress sensing means as being imposed on the gate oxide film, comprises a forward voltage stress and a reverse voltage stress, and

wherein the control means controls the intensity of the electric field, generated by the electric field generating means, so that the forward and reverse voltage stresses imposed on the gate oxide film fall within first and second preset threshold value ranges, respectively, the second range being lower than the first range.

10. A method for carrying out a burn-in test on a great

number of semiconductor devices that have been formed on a semiconductor wafer, each said device including a gate oxide film between a substrate and a gate electrode, the gate electrode being connected to a metal interconnect,

wherein the method comprises the step of exposing the wafer to an electric field as an alternating current wave and setting the electric field placed on the gate oxide film of each said device on the wafer to a predetermined intensity, thereby carrying out the burn-in test on the devices.

11. The method of Claim 10, comprising the steps of:

sensing a voltage stress imposed on the gate oxide film of each said device while the wafer is being exposed to the electric field; and

controlling the intensity of the electric field generated so that the voltage stress sensed as being imposed on the gate oxide film falls within a preset threshold value range.

12. The method of Claim 11, wherein the voltage stress, which has been sensed as being imposed on the gate oxide film, comprises a forward voltage stress and a reverse voltage stress, and

wherein the intensity of the electric field generated is controlled so that the forward and reverse voltage stresses imposed on the gate oxide film fall within first and second

preset threshold value ranges, respectively, the second range being lower than the first range.

13. A system for carrying out a burn-in test on a great number of semiconductor devices that have been formed on a semiconductor wafer, each said device including a gate oxide film between a substrate and a gate electrode, the gate electrode being connected to a metal interconnect, the system comprising:

electric field generating means including a conductive plate for exposing the wafer to an electric field as a direct current wave, the generating means setting the electric field placed on the gate oxide film of each said device on the wafer to a predetermined intensity; and

driving means for loading and unloading the wafer into/from a space where the electric field, generated from the conductive plate, exists,

whereby the wafer is exposed to an alternating-current electric field to carry out the burn-in test on the devices.

14. The system of Claim 13, wherein the driving means loads and unloads the wafer into/from the space so that a ratio of a period, during which the wafer stays inside the electric field generated from the conductive plate, to a period, during which the wafer stays outside of the electric field,

meets a predetermined value.

15. The system of Claim 14, wherein the predetermined ratio is given by

$$E2/(E1+E2):E1/(E1+E2)$$

where E1 and E2 are respective intensities of forward and reverse electric fields placed on the gate oxide film of each said device.

16. A method for carrying out a burn-in test on a great number of semiconductor devices that have been formed on a semiconductor wafer, each said device including a gate oxide film between a substrate and a gate electrode, the gate electrode being connected to a metal interconnect, the method comprising the steps of:

exposing the wafer to an electric field that has been generated as a direct current wave from a conductive plate; and

loading and unloading the wafer into/from a space, where the electric field generated from the conductive plate exists, to expose the wafer to the electric field intermittently,

whereby the wafer is exposed to an alternating-current electric field to carry out the burn-in test on the devices.